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**Multicellular Interactions in 3D Engineered Myocardial Tissue.**

**Journal:** Front Cardiovasc Med

**Publication Year:** 2018

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**PubMed link:** 30406114

**Funding Grants:** iPSC-Derived Smooth Muscle Progenitors for Treatment of Abdominal Aortic Aneurysm

**Public Summary:**

Cardiovascular disease is a leading cause of death in the US and many countries worldwide. Current cell-based clinical trials to restore cardiomyocyte (CM) health by local delivery of cells have shown only moderate benefit in improving cardiac pumping capacity. CMs have highly organized physiological structure and interact dynamically with non-CM populations, including endothelial cells and fibroblasts. Within engineered myocardial tissue, non-CM populations play an important role in CM survival and function, in part by secreting paracrine factors and cell-cell interactions. In this review, we summarize the progress of engineering myocardial tissue with pre-formed physiological multicellular organization, and present the challenges toward clinical translation.

**Scientific Abstract:**

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